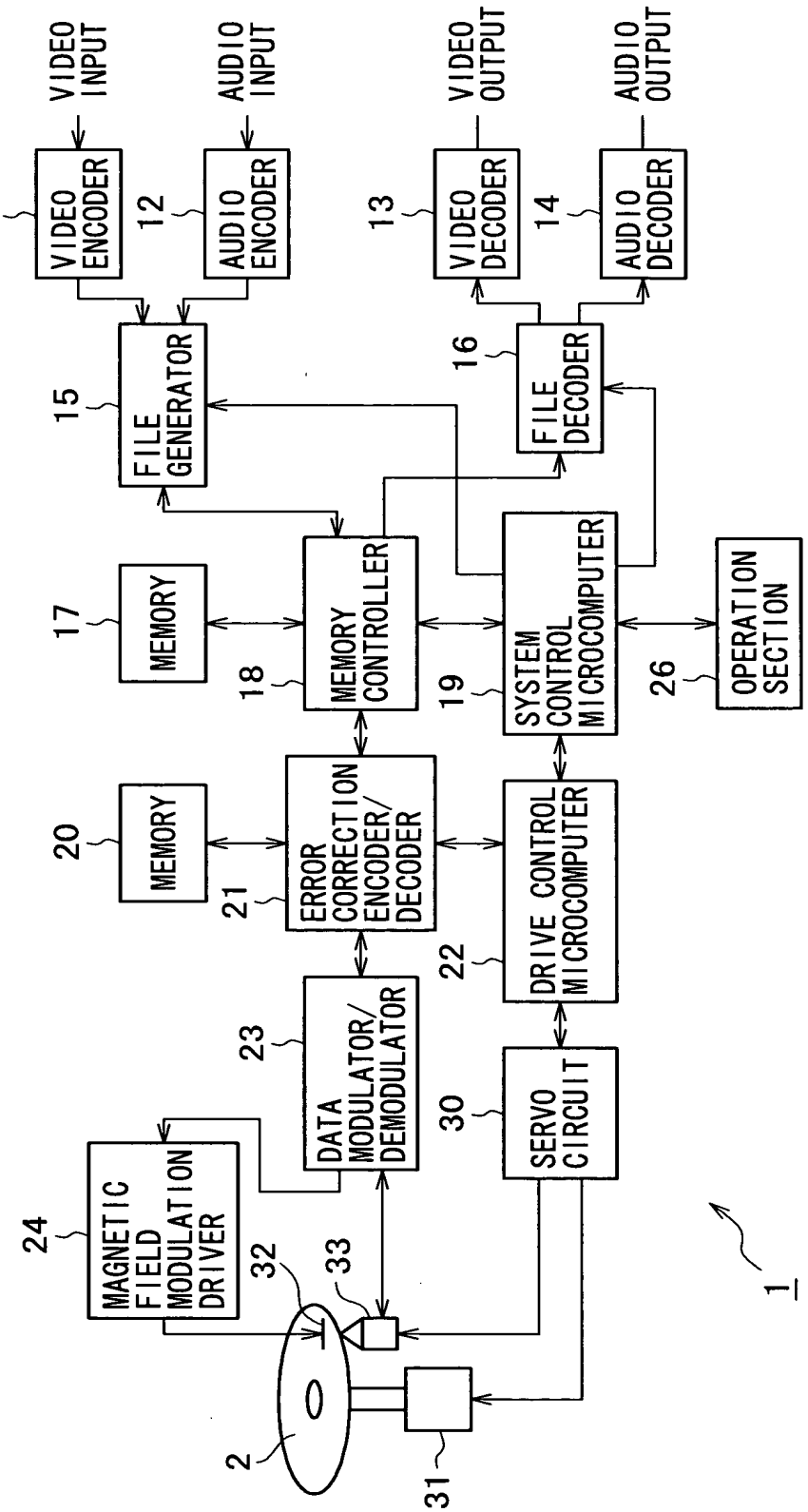
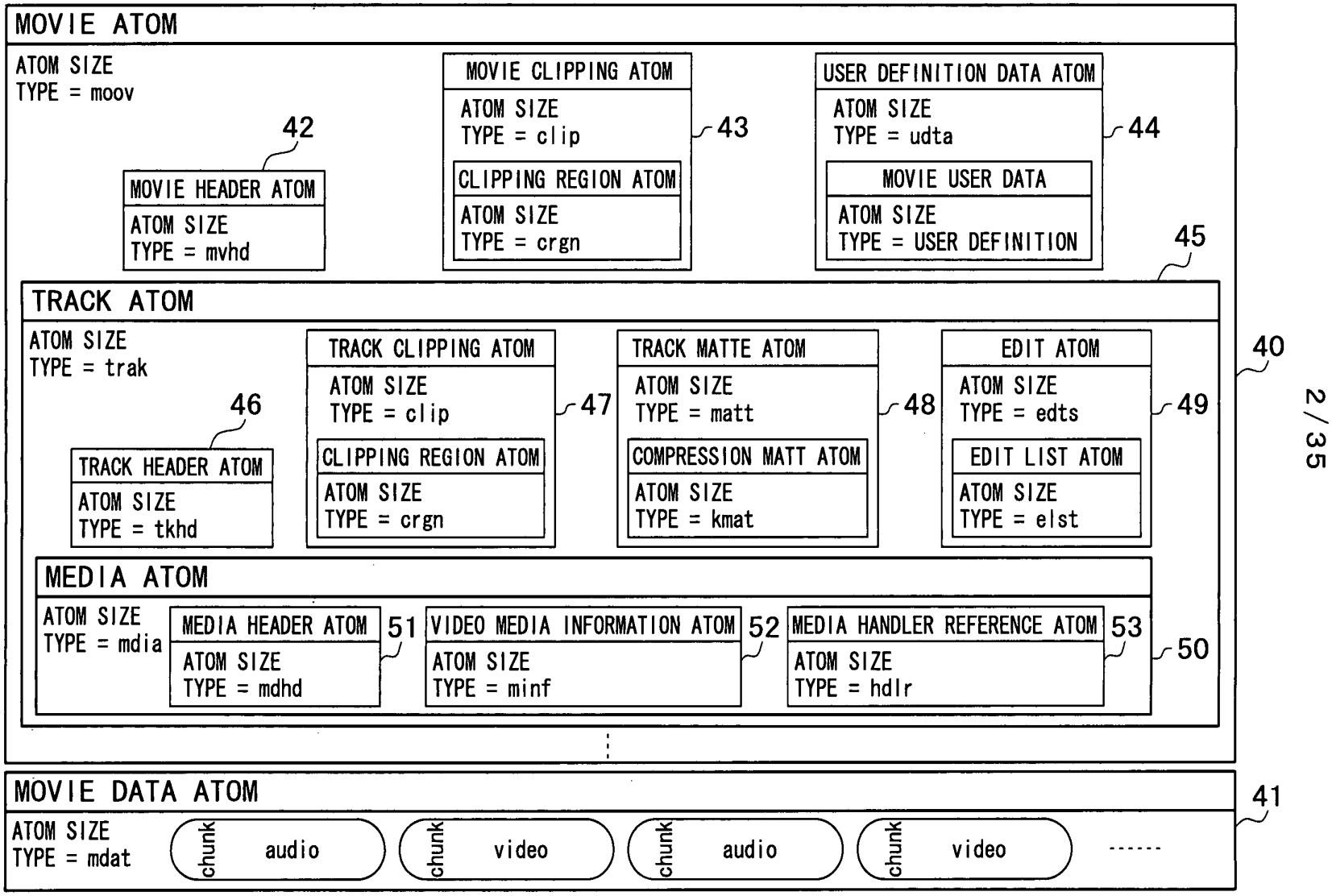
FIG. 1


VIDEO INPUT
AUDIO INPUT
VIDEO OUTPUT
AUDIO OUTPUT
11
VIDEO ENCODER
12
AUDIO ENCODER
13
VIDEO DECODER
14
AUDIO DECODER
15
FILE GENERATOR
16
FILE DECODER
17
MEMORY
18
MEMORY CONTROLLER
19
SYSTEM CONTROL MICROCOMPUTER
26
OPERATION SECTION
20
MEMORY
21
ERROR CORRECTION ENCODER/ DECODER
22
DRIVE CONTROL MICROCOMPUTER
23
DATA MODULATOR/ DEMODULATOR
30
SERVO CIRCUIT
24
MAGNETIC FIELD MODULATION DRIVER
32
33
2
31
1

F I G. 2


MOVIE ATOM
ATOM SIZE
TYPE = moov
42
MOVIE HEADER ATOM
ATOM SIZE
TYPE = mvhd
MOVIE CLIPPING ATOM
ATOM SIZE
TYPE = clip
43
CLIPPING REGION ATOM
ATOM SIZE
TYPE = crgn
USER DEFINITION DATA ATOM
ATOM SIZE
TYPE = udta
44
MOVIE USER DATA
ATOM SIZE
TYPE = USER DEFINITION
45
TRACK ATOM
ATOM SIZE
TYPE = trak
46
TRACK HEADER ATOM
ATOM SIZE
TYPE = tkhd
TRACK CLIPPING ATOM
ATOM SIZE
TYPE = clip
47
CLIPPING REGION ATOM
ATOM SIZE
TYPE = crgn
TRACK MATTE ATOM
ATOM SIZE
TYPE = matt
48
COMPRESSION MATT ATOM
ATOM SIZE
TYPE = kmat
EDIT ATOM
ATOM SIZE
TYPE = edts
49
EDIT LIST ATOM
ATOM SIZE
TYPE = elst
40
MEDIA ATOM
ATOM SIZE
TYPE = mdia
MEDIA HEADER ATOM
ATOM SIZE
TYPE = mdhd
51
VIDEO MEDIA INFORMATION ATOM
ATOM SIZE
TYPE = minf
52
MEDIA HANDLER REFERENCE ATOM
ATOM SIZE
TYPE = hdlr
53
50
MOVIE DATA ATOM
ATOM SIZE
TYPE = mdat
chunk
audio
chunk
video
chunk
audio
chunk
video

41

FIG. 3

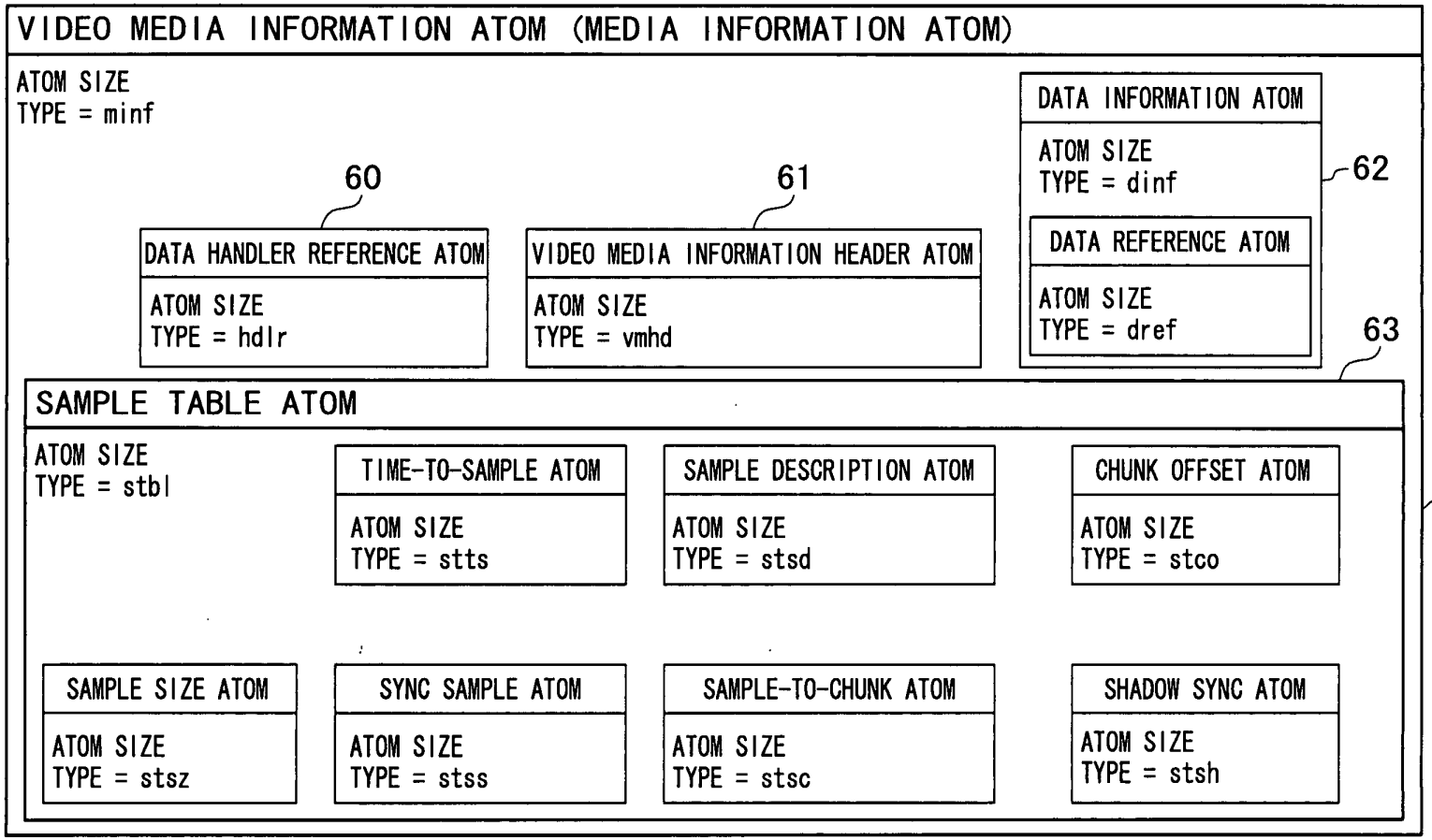

VIDEO MEDIA INFORMATION ATOM (MEDIA INFORMATION ATOM)
ATOM SIZE
TYPE = minf
60
DATA HANDLER REFERENCE ATOM
ATOM SIZE
TYPE = hdlr
61
VIDEO MEDIA INFORMATION HEADER ATOM
ATOM SIZE
TYPE = vmhd
DATA INFORMATION ATOM
ATOM SIZE
TYPE = dinf
62
DATA REFERENCE ATOM
ATOM SIZE
TYPE = dref
63
SAMPLE TABLE ATOM
ATOM SIZE
TYPE = stbl
TIME-TO-SAMPLE ATOM
ATOM SIZE
TYPE = stts
SAMPLE DESCRIPTION ATOM
ATOM SIZE
TYPE = stsd
CHUNK OFFSET ATOM
ATOM SIZE
TYPE = stco
52
SAMPLE SIZE ATOM
ATOM SIZE
TYPE = stsz
SYNC SAMPLE ATOM
ATOM SIZE
TYPE = stss
SAMPLE-TO-CHUNK ATOM
ATOM SIZE
TYPE = stsc
SHADOW SYNC ATOM
ATOM SIZE
TYPE = stsh

FIG. 4

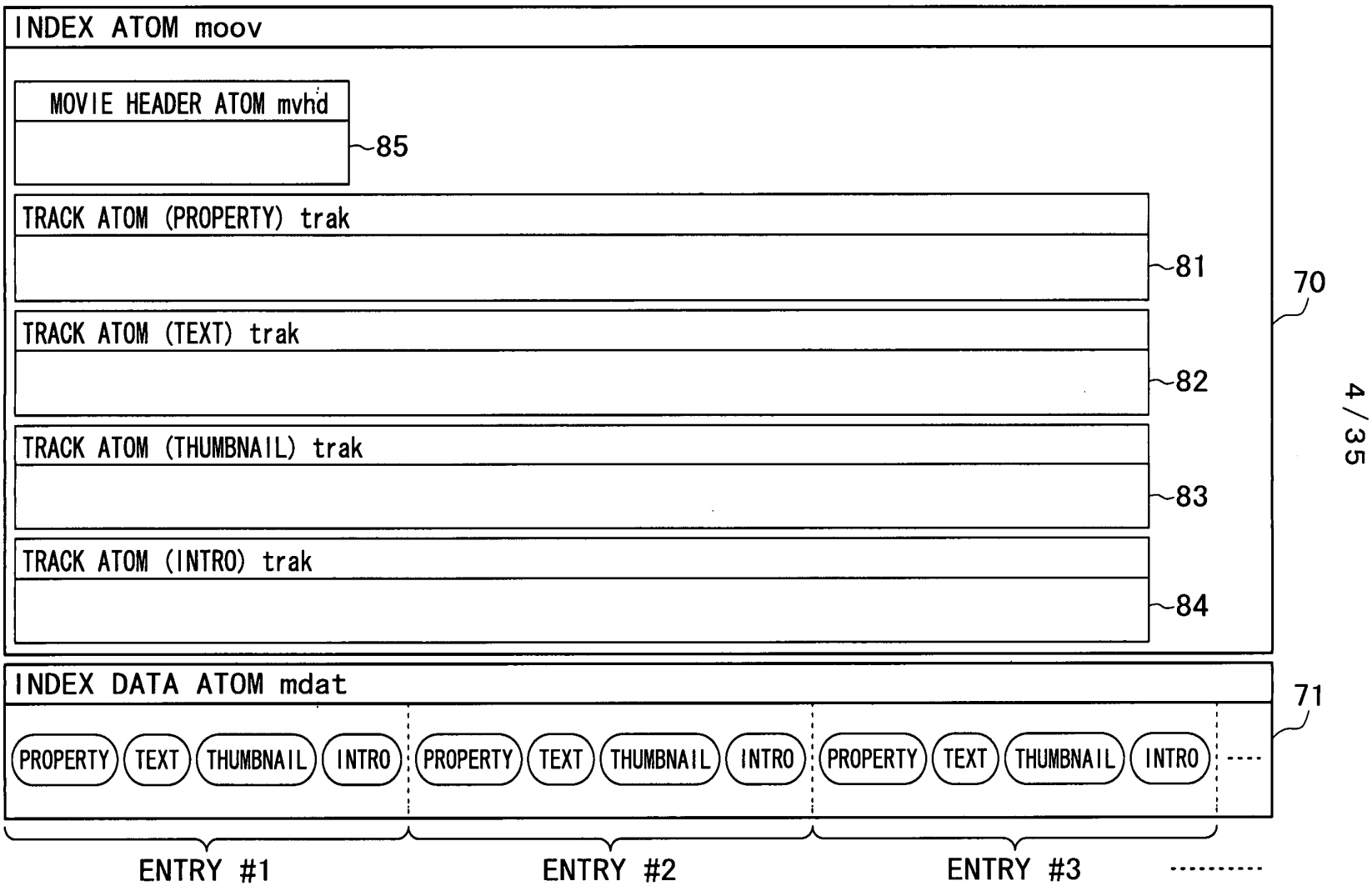

INDEX ATOM moov
MOVIE HEADER ATOM mvhd
85
TRACK ATOM (PROPERTY) trak
81
TRACK ATOM (TEXT) trak
82
TRACK ATOM (THUMBNAIL) trak
83
TRACK ATOM (INTRO) trak
84
70
INDEX DATA ATOM mdat
71
PROPERTY
TEXT
THUMBNAIL
INTRO
PROPERTY
TEXT
THUMBNAIL
INTRO
PROPERTY
TEXT
THUMBNAIL
INTRO
ENTRY #1
ENTRY #2
ENTRY #3

FIG. 5

RBP	Length	Field Name
0	L AP1	AV File Property #1
L AP1	L AP2	AV File Property #2
L AP1+L AP2	L AP3	AV File Property #3
⋮	⋮	⋮
	L APn	AV File Property #n

FIG. 6

RBP	Length	Field Name
0	L AT1	AV File Title #1
L AT1	L AT2	AV File Title #2
L AT1+L AT2	L AT3	AV File Title #3
⋮	⋮	⋮
	L ATn	AV File Title #n

FIG. 7

RBP	Length	Field Name
0	L TH1	AV File Thumbnail Picture #1
L TH1	L TH2	AV File Thumbnail Picture #2
L TH1+L TH2	L TH3	AV File Thumbnail Picture #3
⋮	⋮	⋮
	L THn	AV File Thumbnail Picture #n

FIG. 8

RBP	Length	Field Name
0	L IS1	AV File Intro Music #1
L IS1	L IS2	AV File Intro Music #2
L IS1+L IS2	L IS3	AV File Intro Music #3
⋮	⋮	⋮
	L ISn	AV File Intro Music #n

FIG. 9

RBP	Length	Data
0	16	Property Entry Header
16	32	Basic Property Data
56	L P EX	Property Extension Data

FIG. 10

RBP	Length	Field Name
0	2	Entry Number
2	2	Parent Entry Number
4	2	Property Entry Flags
6	2	Play-order
8	4	Entry Data Size
12	2	Next-extends-entry
14	2	reserved

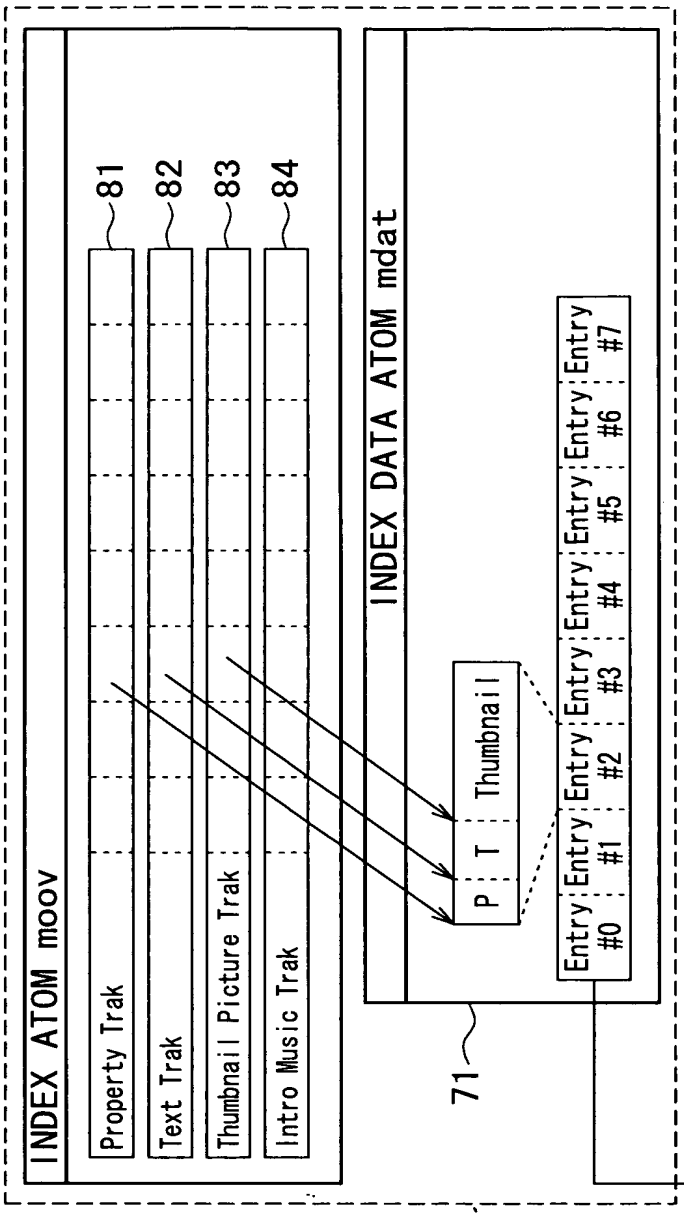


FIG. 11A

Entry Number	0	1	2	3	4	5	6	7
PE-Flags(1) 0:Folder 1:File	0	1	1	0	0	1	1	1
PE-Flags(0) 0:Original 1:Favorite	0	0	0	0	0	0	0	0
Parent Entry Number	X	0	0	0	3	3	4	4

FIG. 11B

FIG. 12A

Entry Number		0	1	2	3	4	5	6	7
PE-Flags(1)	0:Folder 1:File	0	1	1	0	0	1	1	1
PE-Flags(0)	0:Original 1:Favorite	0	0	0	0	0	0	0	0
Parent Entry Number		X	0	0	0	3	3	4	4
Binary File Identifier/URL		X	File -a	File -b	X	X	File -c	File -d	File -e

FIG. 12B

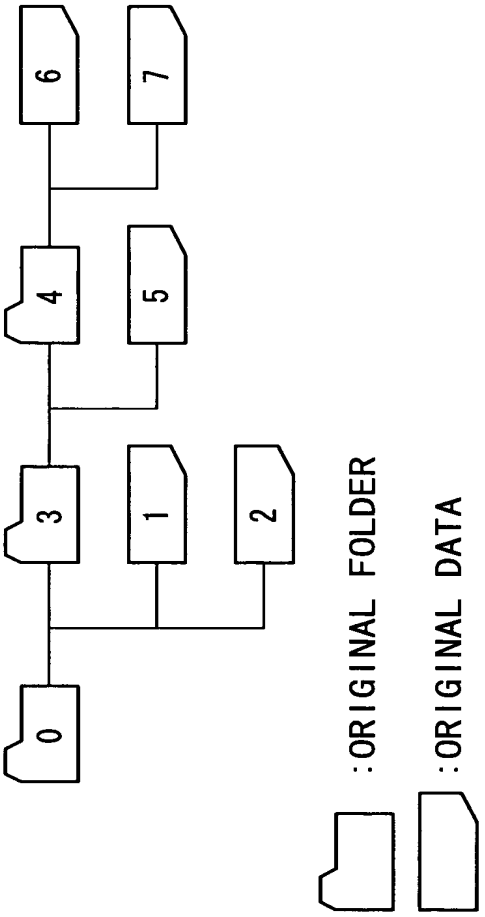


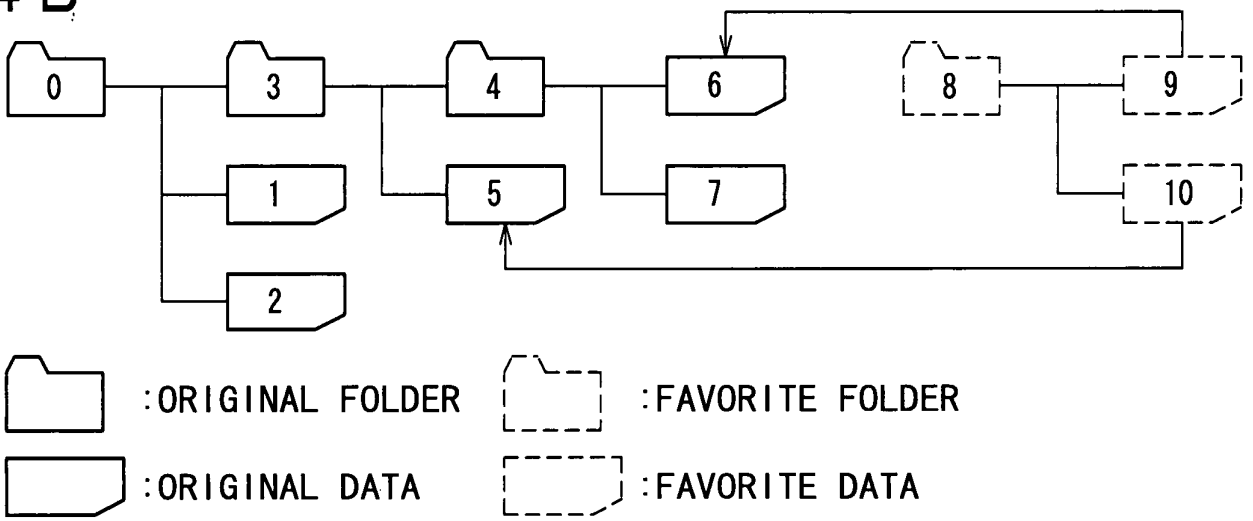
FIG. 13

Bit	Field Name
15:14	Reserved
13	Intro Music Entry has extended
12	Thumbnail Entry has extended
11	Title Entry has extended
10	Parent File
9	Child File
8	Reference
7:5	Reserved
4	Valid
3	Reserved
2	Extends
1	File/Folder
0	Original/Favorite

FIG. 14A

Entry Number		0	1	2	3	4	5	6	7	8	9	10
PE-Flags(1)	0:Folder 1:File	0	1	1	0	0	1	1	1	0	1	1
PE-Flags(0)	0:Original 1:Favorite	0	0	0	0	0	0	0	0	1	1	1
Parent Entry Number		X	0	0	0	3	3	4	4	0	8	8
Play-Order		X	1	5	X	X	2	4	3	1	2	1
Binary File Identifier/URL		X	File -a	File -b	X	X	File -c	File -d	File -e		File -d	File -c

FIG. 14B



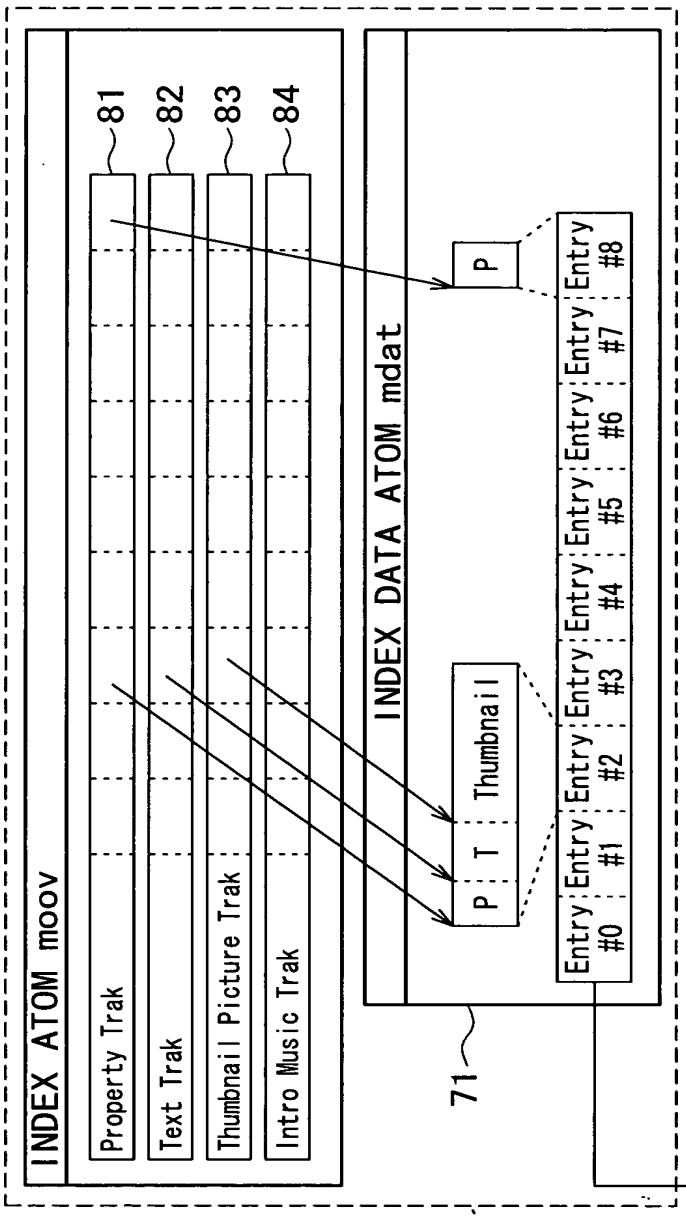


FIG. 15A

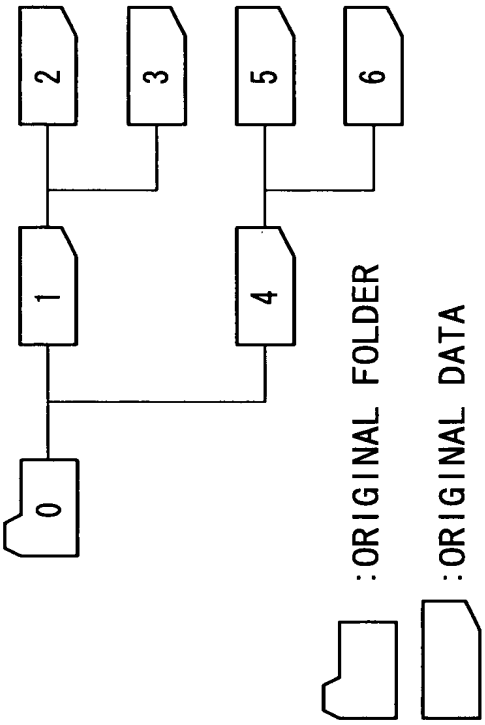
Entry Number		0	1	2	3	4	5	6	7	8
PE-Flags(1)	0:Folder 1:File	0	1	1	0	0	1	1	1	1
PE-Flags(0)	0:Original 1:Favorite	0	0	0	0	0	0	0	0	0
PE-Flags(2)	1:Extends	0	0	0	0	0	0	0	0	1
Parent Entry Number		X	0	0	0	3	3	4	4	0
Next Extends Entry		0	0	8	0	0	0	0	0	0

FIG. 15B

FIG. 16A

Entry Number		0	1	2	3	4	5	6
PE-Flags(1)	0:Folder 1:File	0	1	1	1	1	1	1
PE-Flags(0)	0:Original 1:Favorite	0	0	0	0	0	0	0
PE-Flags(10)	1:Parent	0	1	0	0	1	0	0
PE-Flags(9)	1:Child	0	0	1	1	0	1	1
PE-Flags(8)	1:Reference	0	1	0	0	1	0	0
Parent Entry Number		X	0	0	0	0	0	0
Referring File Counter		0	0	1	1	0	1	1
Referred File List		X	X	1	1	X	4	4

FIG. 16B



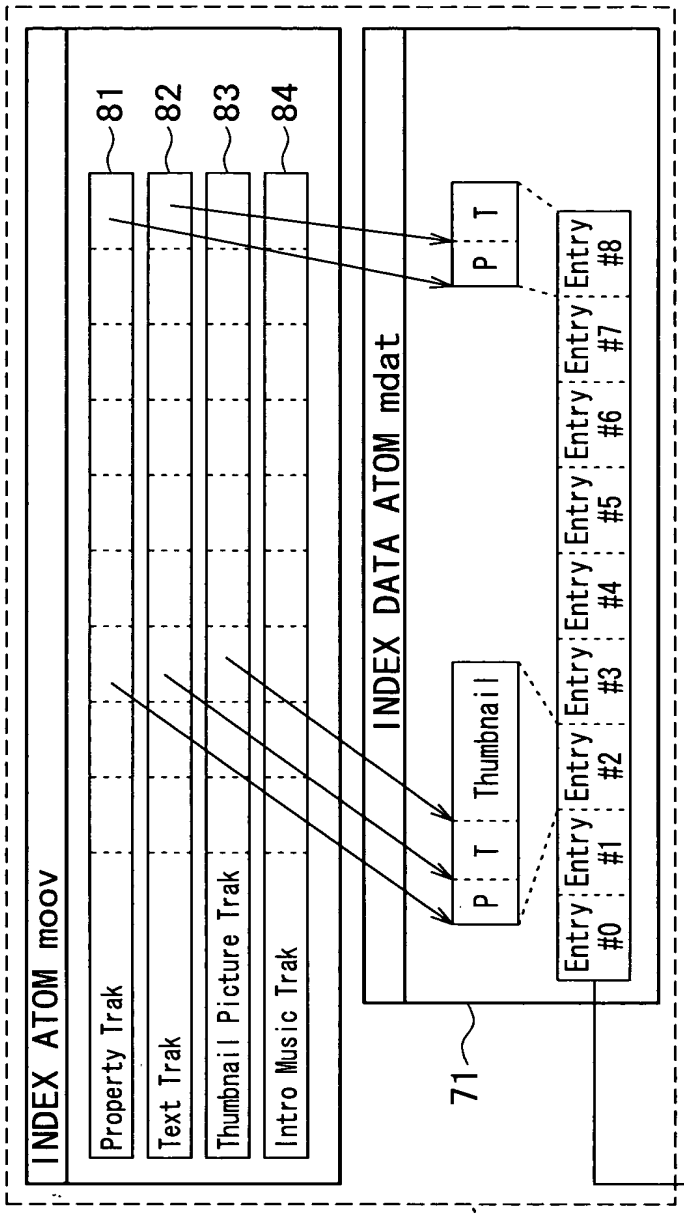


FIG. 17A

Entry Number		0	1	2	3	4	5	6	7	8
PE-Flags(1)	0:Folder 1:File	0	1	1	0	0	1	1	1	1
PE-Flags(0)	0:Original 1:Favorite	0	0	0	0	0	0	0	0	0
PE-Flags(2)	1:Extends	0	0	0	0	0	0	0	0	1
PE-Flags(11)	1:Title Extends	0	0	0	0	0	0	0	0	1
Parent Entry Number		X	0	0	0	3	3	4	4	0
Next Extends Entry		0	0	8	0	0	0	0	0	0

FIG. 17B

FIG. 18A

Entry Number		0	1	2	3	4	5	6	7
PE-Flags(1)	0:Folder 1:File	0	1	1	0	0	1	1	1
PE-Flags(0)	0:Original 1:Favorite	0	0	0	0	0	0	0	0
Parent Entry Number			0	0	0	3	3	4	4
Play Order		X	1	5	X	X	2	4	3

FIG. 18B

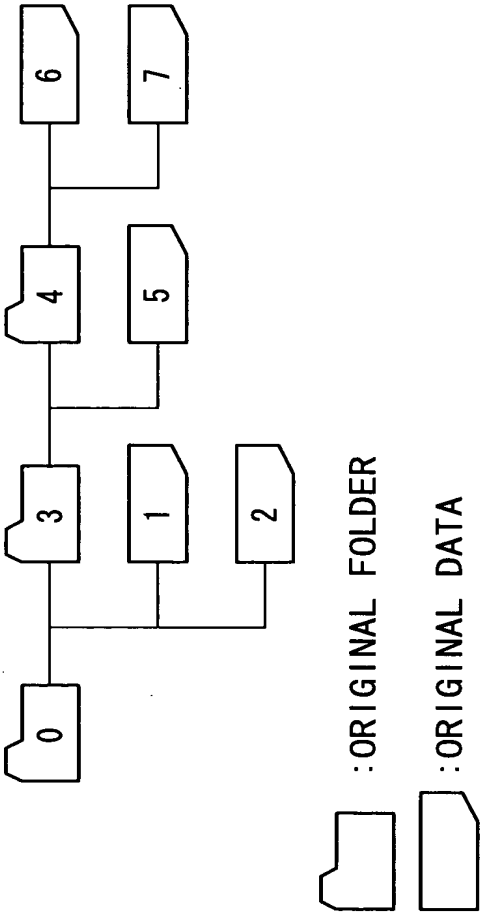


FIG. 19A

Entry Number		0	1	2	3	4	5	6	7
PE-Flags(1)	0:Folder 1:File	0	1	1	0	0	1	1	1
PE-Flags(0)	0:Original 1:Favorite	0	0	0	0	0	0	0	0
Parent Entry Number			0	0	0	3	3	4	4
Play Order		1	5	0	X	X	7	2	6

FIG. 19B

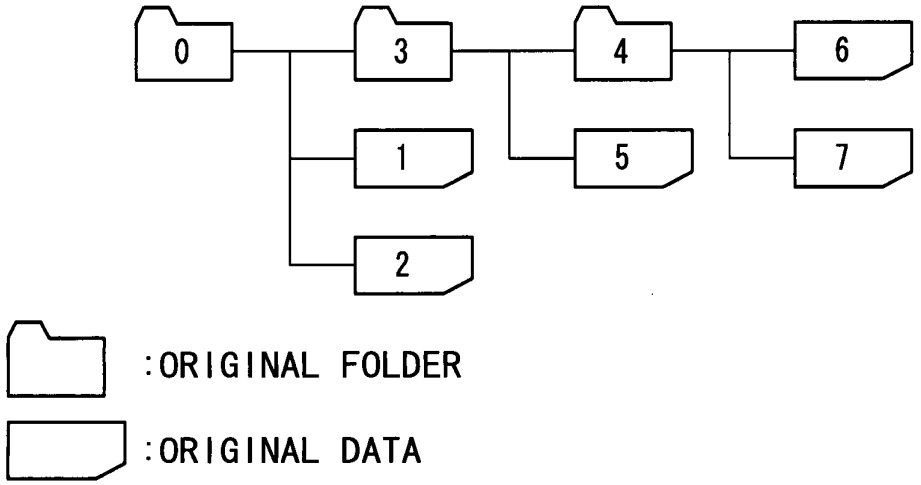


FIG. 20

RBP	Length	Field Name
0	4	Format Brand
4	4	Media profile
8	2	Contents status flags
10	2	Reserved
12	4	Creation Time
16	4	Modification Time
20	4	Duration
24	6	Binary File Identifier
30	2	Referred Counter

FIG. 21

Bit	Field Name
15:8	Contents Type
7:6	Reserved
5	AV File Has Intro Music
4	AV File has Thumbnail Picture
3	AV File has Title
2	AV Index File has Intro Music of AV File
1	AV Index File has Thumbnail Picture of AV File
0	AV Index File has Title of AV File

FIG. 22

RBP	Length	Field Name
0	L P RF	Referring File List
L P RF	L P GF	Grouping File List
L P RF+ L P GF	L P UR	URL
L P RF+ L P GF+ L P UR	L P PD *N	Private Property Data [N]
L P RF+ L P GF+ L P UR+ L P PD *N	L P PE *M	Private Property Entry [M]

FIG. 23

RBP	Length	Field Name
0	4	Size
4	4	Type
8	2[n]	Referring File Entry Number [n]

FIG. 24

RBP	Length	Field Name
0	4	Size
4	4	Type
8	2[n]	Grouping Entry Number [n]

FIG. 25A

Entry Number		0	1	2	3	4	5	6	7	8
PE-Flags(1)	0:Folder 1:File	0	1	1	0	0	1	1	1	0
PE-Flags(0)	0:Original 1:Favorite	0	0	0	0	0	0	0	0	1
Parent Entry Number		X	0	0	0	3	3	4	4	0
Play-Order		X	1	5	X	X	2	4	3	1
Grouping File List		X	X	X	X	X	X	X	X	6, 5

FIG. 25B

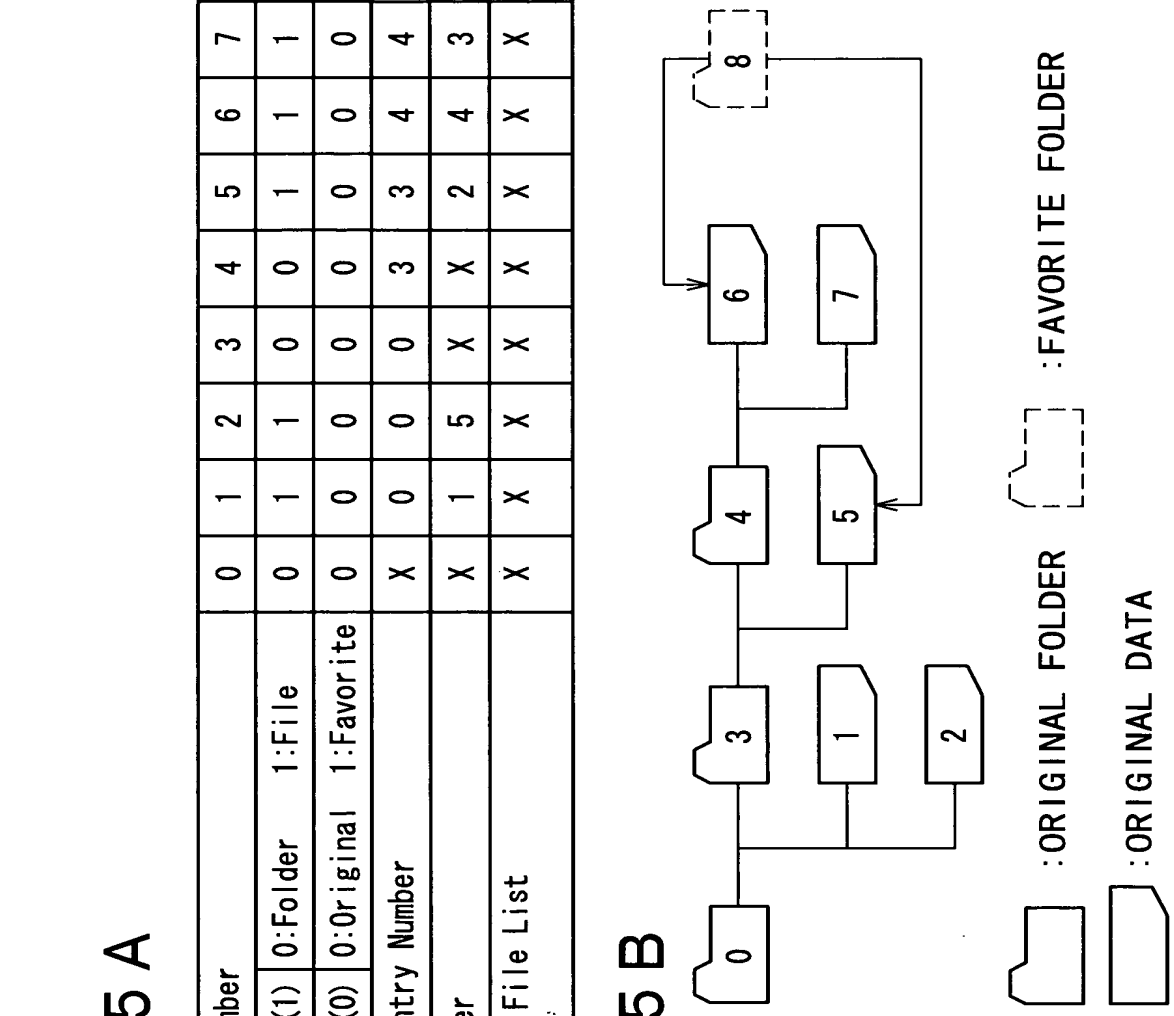


FIG. 26

RBP	Length	Field Name
0	4	Size
4	4	Type
8	n	URL

FIG. 27

RBP	Length	Field Name
0	4	Size
4	4	Type
8	4	Owner
12	n	Private Data

FIG. 28

RBP	Length	Field Name
0	4	Size
4	4	Type
8	4	Owner
12	n	Private File URL (Number)
12 + n	4	File Offset
16 + n	4	Data Size

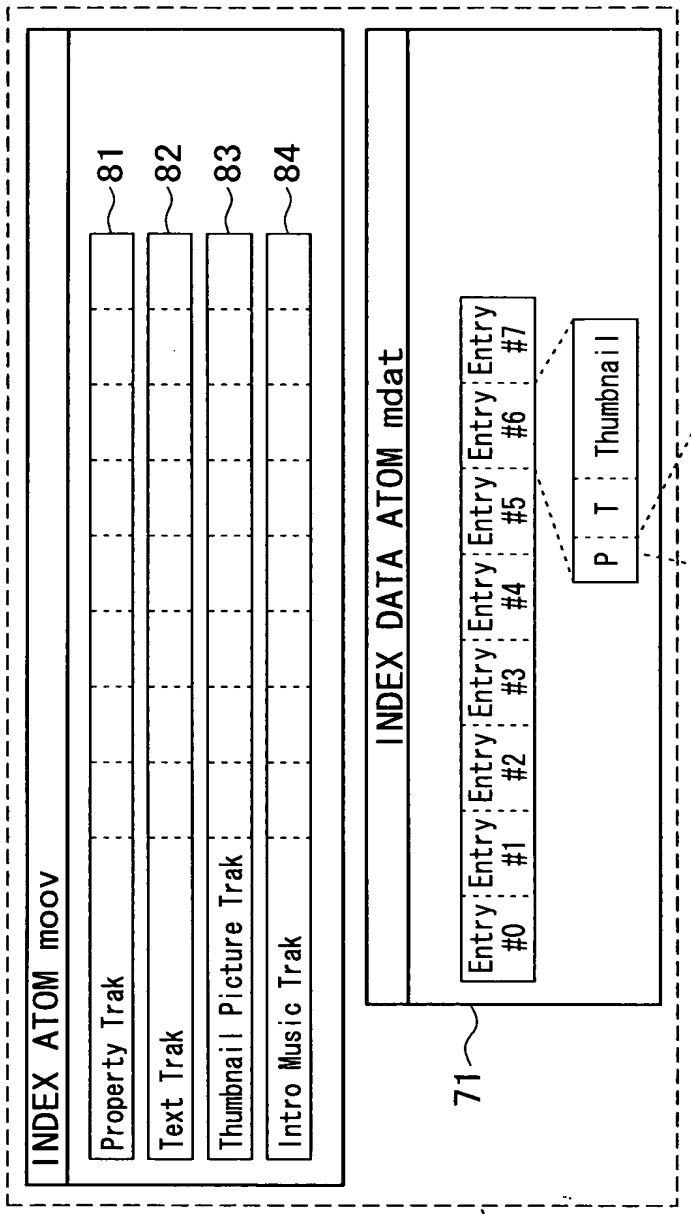


FIG. 29A

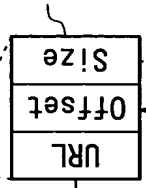


FIG. 29B

FIG. 29C

FIG. 30

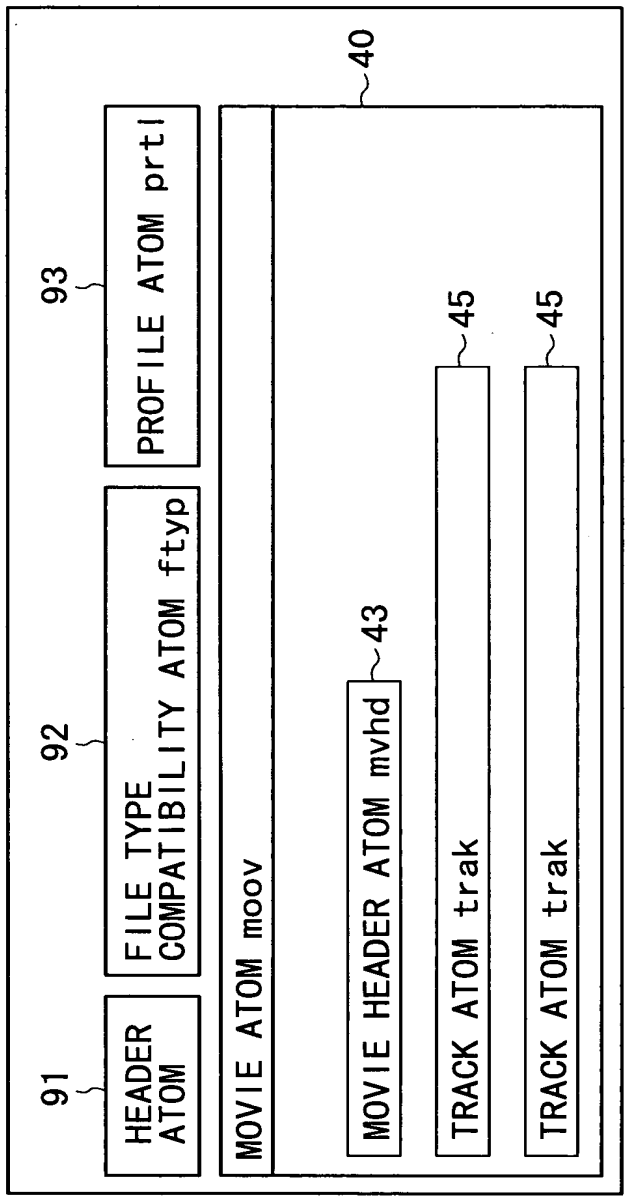

91
HEADER ATOM
92
FILE TYPE COMPATIBILITY ATOM ftyp
93
PROFILE ATOM prtl
40
MOVIE ATOM moov
MOVIE HEADER ATOM mvhd
43
TRACK ATOM trak
45
TRACK ATOM trak
45

FIG. 31

RBP	Length	Field Name
0	4	Size
4	4	Type (=ftyp)
8	4	Major-Brand
12	4	Minor-Version
16	4×N	Compatible-Brand [N]

FIG. 32

RBP	Length	Field Name
0	4	Size
4	4	Type (=prfl)
8	1	Version
9	3	flags
12	4	feature-record-count
15	16×N	feature-record-list

FIG. 33

RBP	Length	Field Name
0	4	track-ID
4	4	sub-part-ID
12	4	feature
16	4	value

FIG. 34

feature	MEANING	VALUE (EXAMPLE)
cdty	TYPE OF CODEC	mp4v(MPEG4 video), mp4a(MPEG4 audio)
brat	BIT RATE OF DATA	64000, 96000, 128000, 192000, 384000[bps]
frat	VIDEO FRAME RATE	10, 15, 24, 30[fps]
srat	AUDIO SAMPLING FREQUENCY	24000, 48000[Hz]
wdth	VIDEO PICTURE SIZE (HORIZONTAL)	176, 352, 704, 720
hght	VIDEO PICTURE SIZE (VERTICAL)	120, 144, 240, 288, 480, 576
frty	FIXED FRAME OR VARIABLE FRAME	cfr(FIXED FRAME RATE), vfr(VARIABLE FRAME RATE)
brty	FIXED BIT RATE OR VARIABLE BIT RATE	cbr(FIXED BIT RATE), vbr(VARIABLE BIT RATE)

FIG. 35

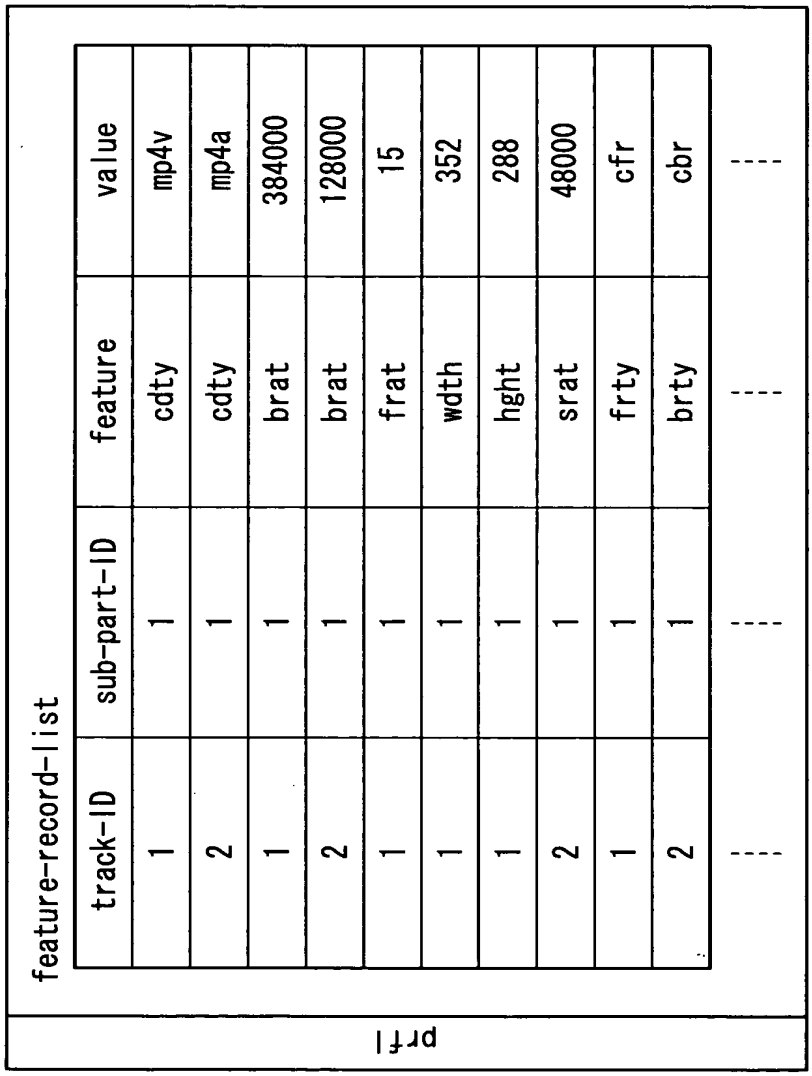

prfl
feature-record-list
track-ID
sub-part-ID
feature
value
1
1
cdty
mp4v
2
1
cdty
mp4a
1
1
brat
384000
2
1
brat
128000
1
1
frat
15
1
1
wdth
352
1
1
hght
288
2
1
srat
48000
1
1
frty
cfr
2
1
brty
cbr

FIG. 36

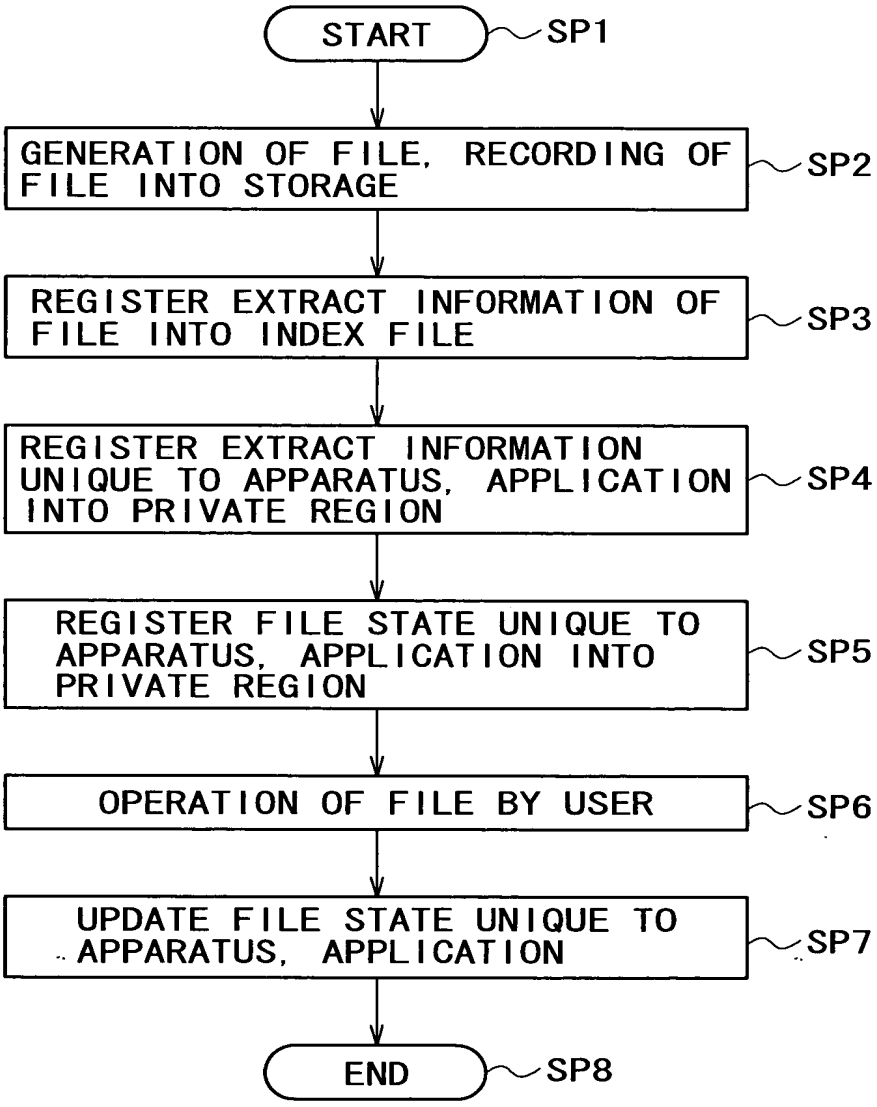

START
SP1
GENERATION OF FILE, RECORDING OF FILE INTO STORAGE
SP2
REGISTER EXTRACT INFORMATION OF FILE INTO INDEX FILE
SP3
REGISTER EXTRACT INFORMATION UNIQUE TO APPARATUS, APPLICATION INTO PRIVATE REGION
SP4
REGISTER FILE STATE UNIQUE TO APPARATUS, APPLICATION INTO PRIVATE REGION
SP5
OPERATION OF FILE BY USER
SP6
UPDATE FILE STATE UNIQUE TO APPARATUS, APPLICATION
SP7
END
SP8

FIG. 37

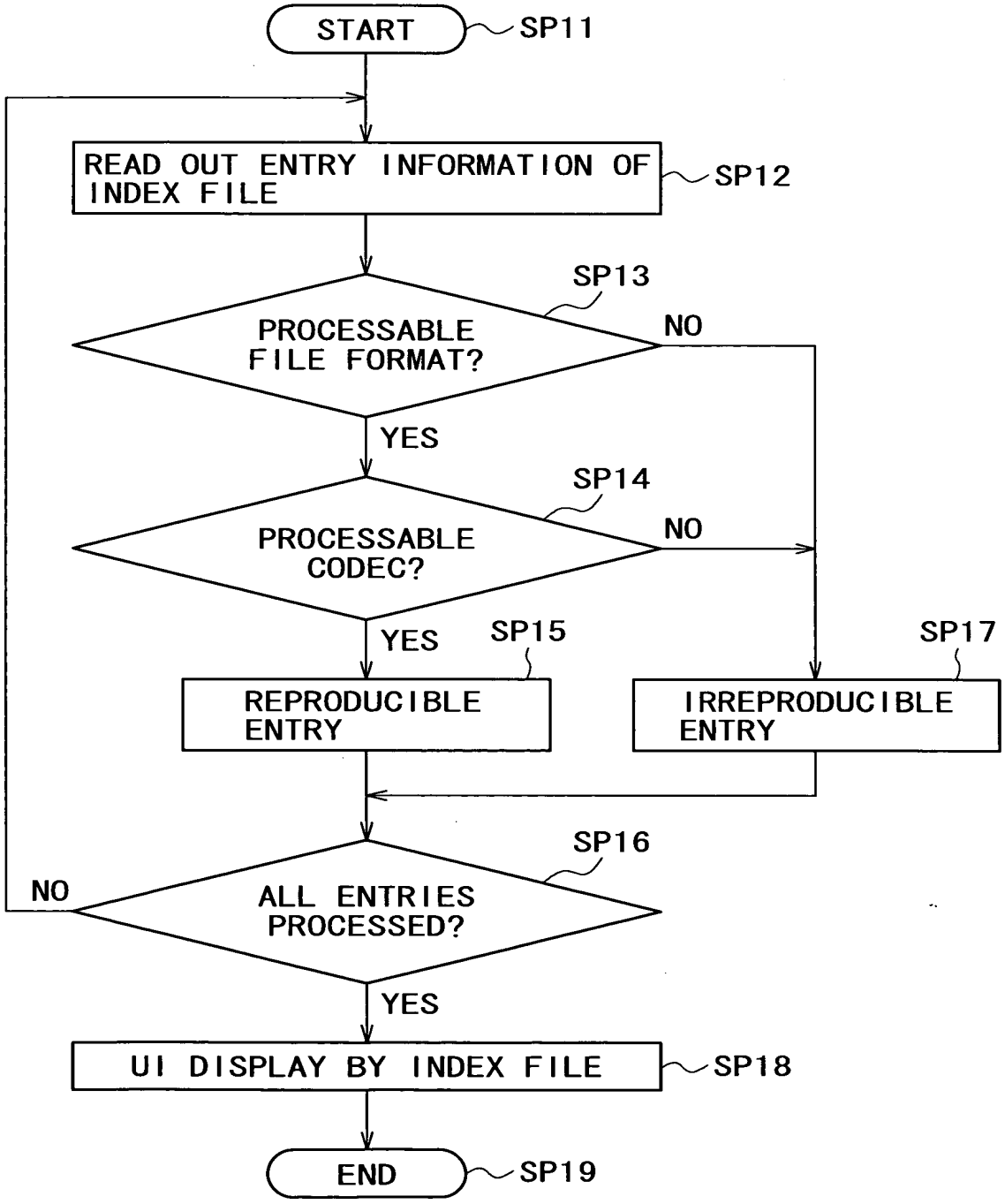

START
SP11
READ OUT ENTRY INFORMATION OF INDEX FILE
SP12
SP13
PROCESSABLE FILE FORMAT?
NO
YES
SP14
PROCESSABLE CODEC?
NO
YES
SP15
REPRODUCIBLE ENTRY
SP17
IRREPRODUCIBLE ENTRY
SP16
NO
ALL ENTRIES PROCESSED?
YES
UI DISPLAY BY INDEX FILE
SP18
END
SP19

FIG. 38

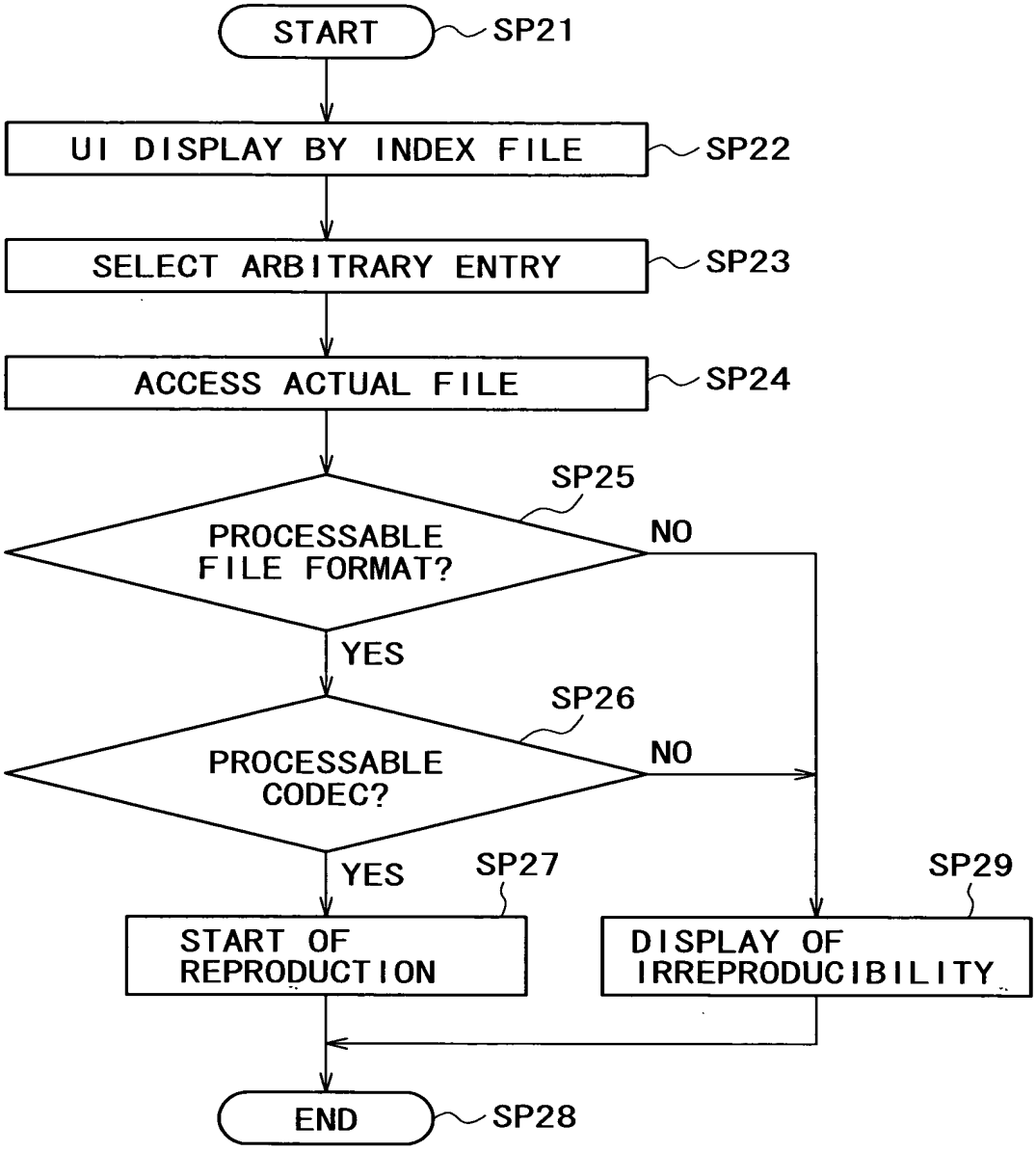

START
SP21
UI DISPLAY BY INDEX FILE
SP22
SELECT ARBITRARY ENTRY
SP23
ACCESS ACTUAL FILE
SP24
SP25
PROCESSABLE FILE FORMAT?
NO
YES
SP26
PROCESSABLE CODEC?
NO
YES
SP27
SP29
START OF REPRODUCTION
DISPLAY OF IRREPRODUCIBILITY
END
SP28

FIG. 39A

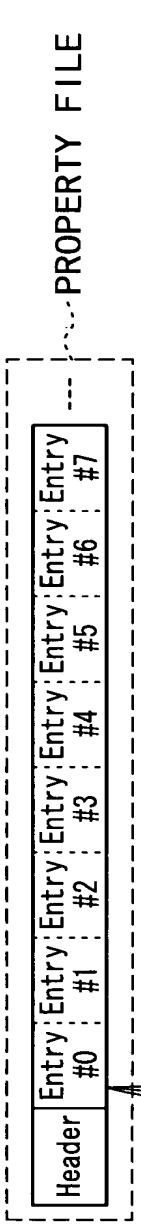


FIG. 39B

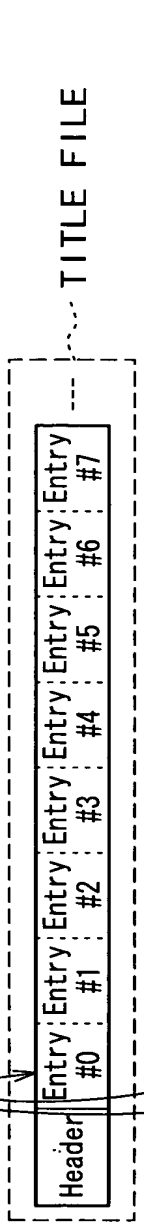


FIG. 39C

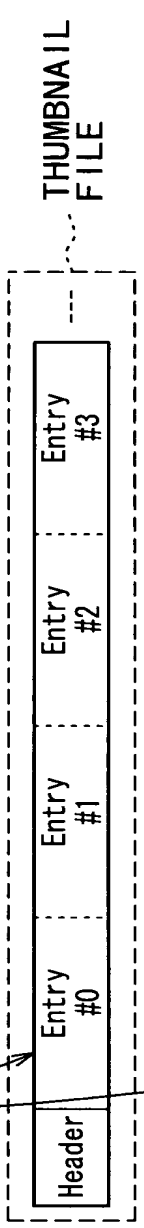


FIG. 39D

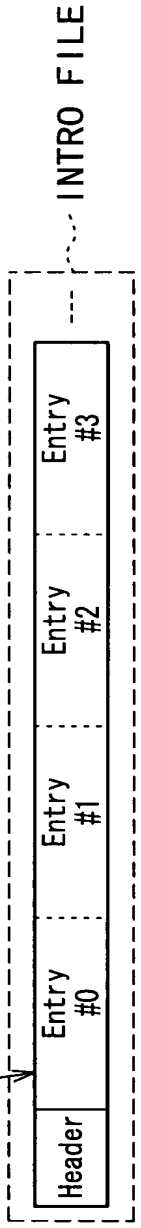


FIG. 40

RBP	Length	Field Name
0	4	Size
4	4	Type
8	n	File URL (Number)
8 + n	4	File Offset
12 + n	4	Data Size

FIG. 41

RBP	Length	Field Name
0	4	Format Brand
4	4	Media profile
8	2	Contents status flags
10	2	Reserved
12	4	Creation Time
16	4	Modification Time
20	4	Duration
24	6	Binary File Identifier
30	2	Referred Counter
32	4	Title File Offset
36	4	Title Size
40	4	Thumbnail File Offset
44	4	Thumbnail Size
48	4	Intro Music File Offset
52	4	Intro Music Size

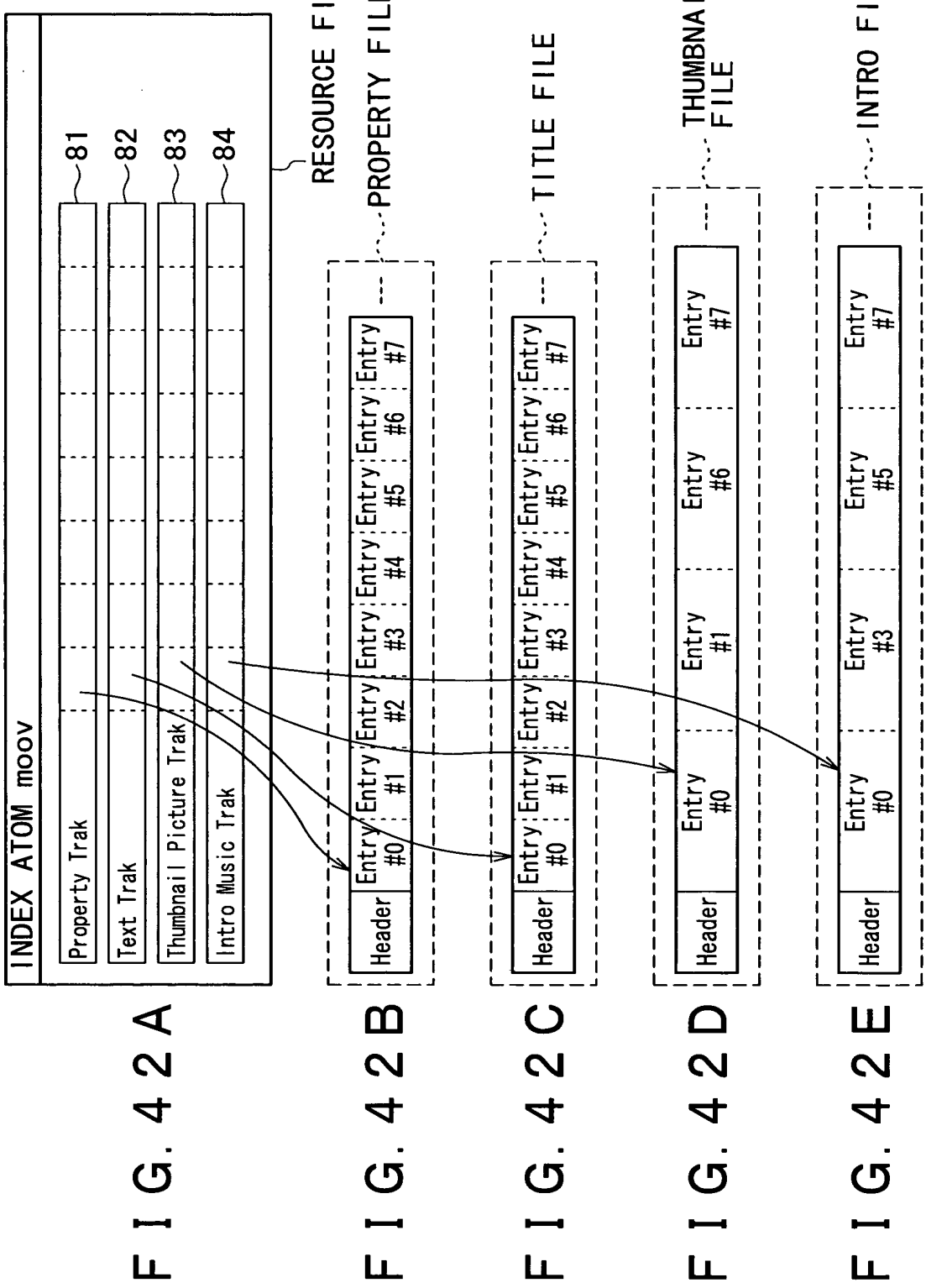


FIG. 42A

FIG. 42B

FIG. 42C

FIG. 42D

FIG. 42E